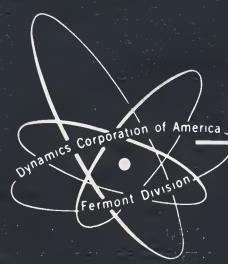


# NO-FAIL POWER

A NEW DIMENSION IN UNINTERRUPTED POWER—



**Fermon**



**Completely reliable equipment operation without even a 0.5 cps frequency fluctuation is at last possible with the Fremont No-Fail Power system. No-Fail Power Frequency Regulation plus No-Fail Power Voltage Regulation results in dependable equipment operation.**

## CONTROL CONSOLE

The monitor controls for Fremont's No-Fail Power System are packaged in a modern console containing advanced solid state devices. This console, which can be remotely located in any convenient area, senses utility power deterioration and instantly activates the NFP energy system, guaranteeing an uninterrupted smooth flow of precise power. This is your insurance against power outages and voltage and frequency fluctuations, any of which can lead to disastrous results in today's sophisticated electronic age.



## THE NO-FAIL POWER SYSTEM

The No-Fail Power System is designed to continually supply precise electrical power to a critical load regardless of the condition of normal commercial power. While an NFP unit is similar in appearance to a common standby engine-generator set, there is a great difference in performance.

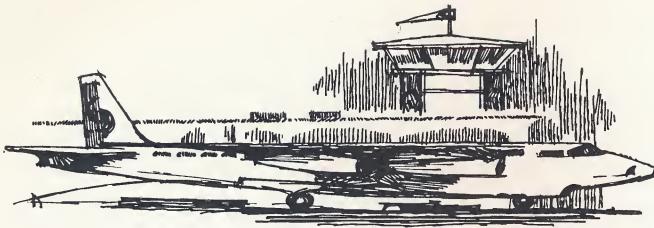
The Fremont No-Fail Power System essentially consists of a motor-alternator, a diesel engine and a stored energy source all assembled as a total energy package. Ordinarily, the system uses commercial power to supply closely regulated voltage and frequency power to a critical load. When commercial power is interrupted, the stored energy source supplies energy until the diesel engine, which has been simultaneously started, assumes the load. The diesel engine has been provided to supply sustained power should commercial power fail for long periods of time. The result — a continuous flow of uninterrupted precise power for your equipment.

Ordinary standby engine generator sets require 10 to 15 seconds after indication of commercial power deterioration to assume the load. Critical loads powered by NFP units sense NO interruption in precise power.

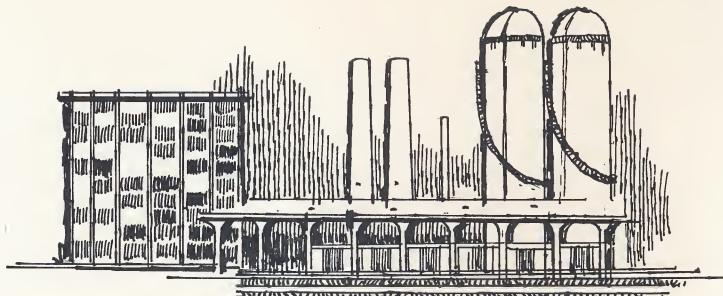
The No-Fail Power System uses a pressurized hydraulic fluid system for its stored energy needs. The Fremont engineers chose this system because of the close regulation possible with hydraulics and its instant response and high energy capabilities. This results in a total energy system that combines the advantages of static and kinetic energy systems and eliminates the inherent limitations of batteries and flywheels.

### CHECK THESE NFP FEATURES:

- Frequency regulation maintained within  $\pm \frac{1}{4}$  cycle of 60 cps through transition from commercial power failure to diesel power — stabilization within 2½ seconds.
- No voltage transient created as a result of commercial power failure.
- Approximately ½ the weight and ⅔ the size of equivalent kinetic energy systems.
- No reverse power feed back.
- Troublesome bearing and clutch wear problems eliminated.
- Commercial power deterioration sensed at generator output thereby giving instant response.
- Shock resistant.
- Full unattended automatic operation.
- No alignment problems.
- Simplified installation.



AIRCRAFT LANDING SYSTEMS



MANUFACTURING

## NO-FAIL POWER INSURANCE

NO-FAIL POWER providing uninterrupted precise frequency and voltage regulated power for:

SURVIVAL — Hospital Operating Room and Intensive Care Units, Hazardous Areas.

DEFENSE — Radar, Communications, Missile firing and tracking operation.

INDUSTRY — Data Processing Systems, Nuclear Reactor Controls, Microwave Repeater Systems, Process Controls, Air Traffic Landing and Control Systems.

Should a power failure occur — in terms of a life saved, an airplane crash averted, a factory shutdown avoided — the No-Fail Power unit provides the insurance needed.



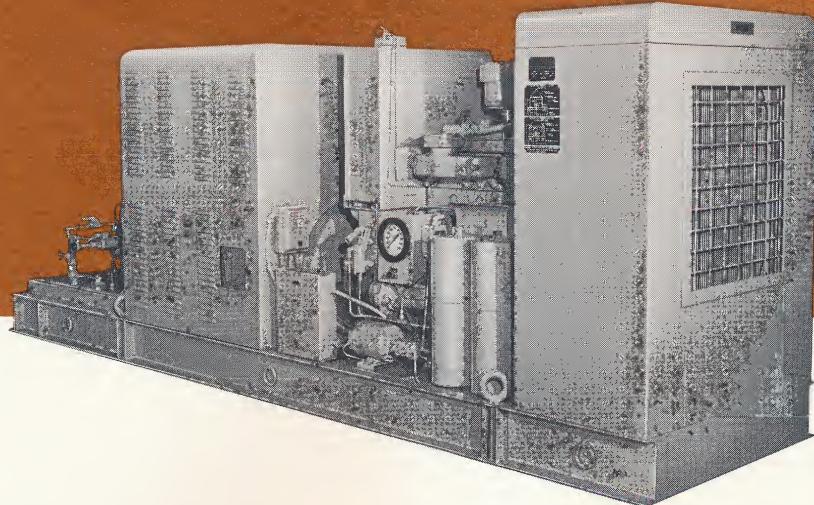
HOSPITALS



RADAR



COMPUTER OPERATION



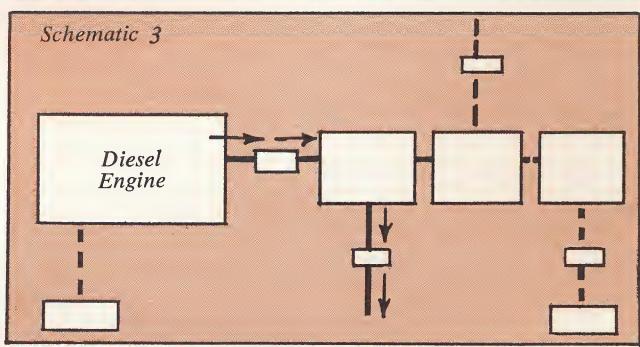
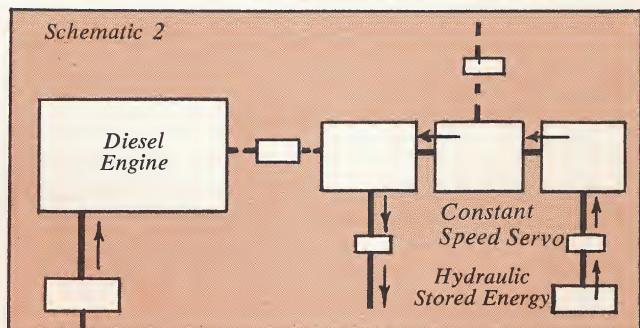
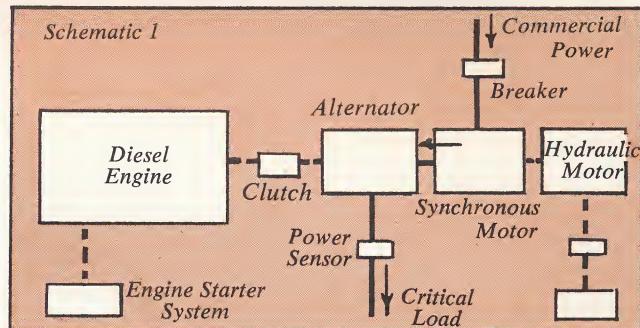
MODEL 100 NFP60  
100KW NO-FAIL POWER UNIT

### THE OPERATION OF A NO-FAIL POWER SYSTEM

Under normal operating conditions prime commercial power drives a synchronous motor which is directly coupled to an alternator. The alternator supplies closely regulated electrical energy for a critical load. The following are in standby condition:

1. — A hydraulic motor.
2. — A diesel engine kept in instant-start-readiness by means of lubricating oil and coolant heaters.
3. — A static stored energy charge of pressurized hydraulic fluid (see schematic 1).

#### POWER FLOW SCHEMATICS



When commercial power fails or becomes irregular beyond pre-set limits, the following sequence of operations occur:

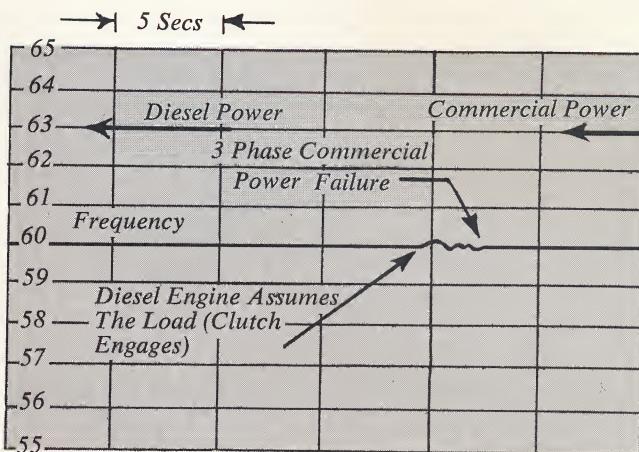
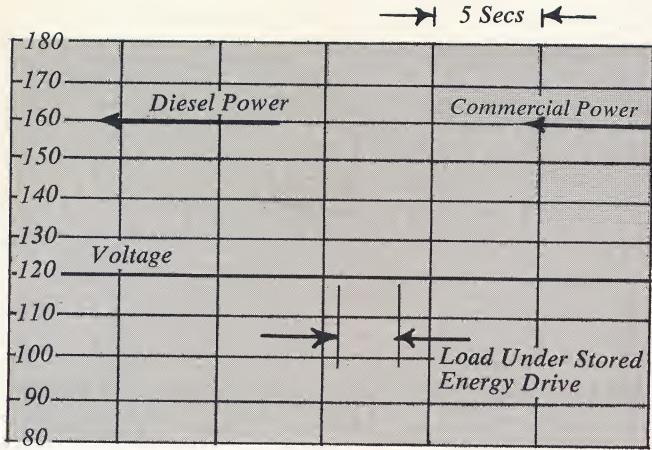
1. — The frequency sensor, sensing the deviation at the alternator output, activates a constant speed servo. This servo regulates the supply of hydraulic fluid to the hydraulic motor maintaining alternator at synchronous speed regardless of load or varying load conditions.
2. — Simultaneously, the diesel engine is started (see schematic 2).

When the diesel engine attains operating speed it is automatically coupled to the motor-alternator shaft by means of an overrunning clutch. The constant speed servo is then deactivated. The diesel engine now supplies rotating power for the alternator (see schematic 3).

During the period of diesel engine operation the condition of commercial power is continually checked by means of a monitoring circuit. When commercial power is found to be stable over an adjustable period of time (15-60 minutes) a synchronization circuit adjusts diesel engine speed synchronizing it with commercial power frequency. When synchronization is achieved the commercial power breaker is closed and the diesel engine shut down. The condition shown in schematic 1 is again in effect.

The entire system is now in standby should another power interruption occur.

All operations of the system are *automatic* and *self-monitoring*.



Model 100 NFP60 Voltage and Frequency recording at 100% load during a full 3 phase commercial Power Failure (a catastrophic failure).

### OPERATING TEMPERATURE

Capable of operation at temperatures from minus 25°F to plus 125°F.

### PRICES

System prices vary with controls and accessories required. Prices available on request.

### REPRESENTATIVE SIZE AND PHYSICAL DIMENSIONS

(Data on other sizes available on request)

SIZE	LENGTH	WIDTH	HEIGHT	WEIGHT
10KW	108"	36"	36"	3,500 Lbs
15KW	108"	36"	36"	3,700 Lbs
30KW	120"	36"	42"	4,500 Lbs
60KW	148"	42"	42"	6,500 Lbs
100KW	186"	48"	72"	8,800 Lbs
150KW	200"	48"	72"	11,000 Lbs
200KW	230"	68"	80"	15,000 Lbs

(All sizes and weights approx.)

## NO-FAIL POWER SYSTEM SPECIFICATIONS

### RATED POWER . . .

10KW through 250KW at 0.8 PF with a 10% overload capability.

### OUTPUT . . .

Any standard operating voltage and frequency, single or three phase.

### VOLTAGE REGULATION . . .

Within a  $\pm 1\%$  bandwidth from no load to full load. Within  $\pm \frac{1}{4}\%$  at constant load.

### VOLTAGE TRANSIENT . . .

$\pm 5\%$  deviation for less than 1 second during a 50% load change. No transient created as a result of utility power failure.

### FREQUENCY REGULATION . . . (ENGINE DRIVE)

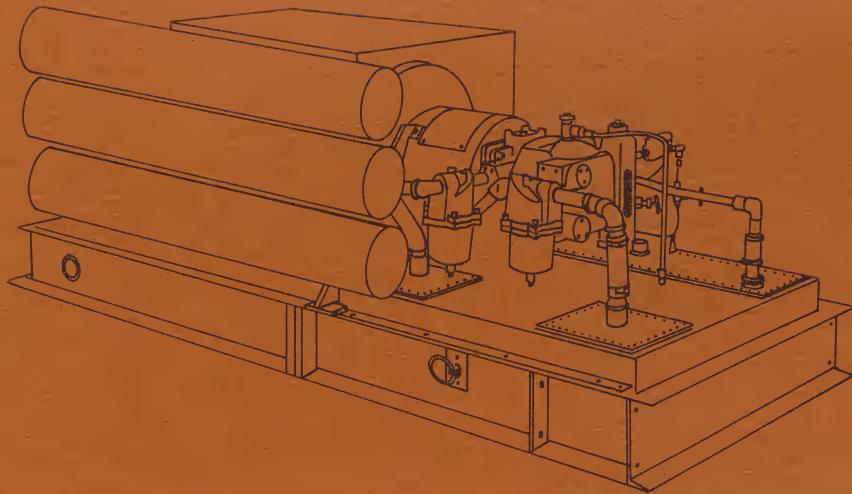
Isochronous,  $\pm \frac{1}{2}\%$  at any constant load.

### FREQUENCY REGULATION . . . (TRANSITION FROM UTILITY POWER TO ENGINE POWER)

$\pm \frac{1}{4}$  cycle.

### FREQUENCY REGULATION . . . (MOTOR DRIVE)

Synchronous with Commercial Power Frequency.



## MODEL NFPS CONTROLS EXISTING ENGINE-GENERATOR SETS

Model NFPS has been designed for those people who have standby engine generators and now have new requirements which need No-Fail Power.

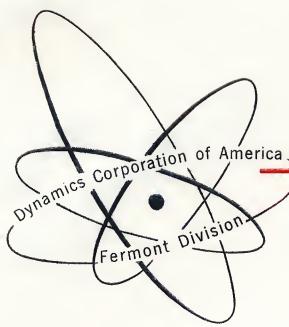
Model NFPS is a No-Fail Power system without a diesel engine. NFPS is similar in operation to the standard NFP with the exception that it integrates an existing engine-generator set in its system operation. When commercial power deteriorates, the stored energy system is activated, maintaining alternator output. The NFPS stored energy system has a capability of maintaining alternator output for any period of time depending on user need and the length of time necessary to start and bring an existing engine generator set to operating speed. Upon attaining this speed, switching devices automatically transfer the driving force from the hydraulic motor to electrical energy being supplied by the existing set. During this transfer, alternator output frequency is maintained within  $\pm \frac{1}{4}$  cycle of 60 cps.

A special feature of NFPS is the ability to provide power for periods of time without the need for starting the existing engine generator set. NFPS has special stored energy circuitry which determines the proper moment to activate the standby set. This circuitry senses the remaining energy in the stored energy system and its function is to activate the standby set only when the energy remaining in the stored energy system reaches a minimum level. This level is determined by the length of time necessary to accelerate the standby set. Therefore, if commercial power returns prior to this level being reached, commercial power reassumes the load and the stored energy system is automatically recharged. The standby engine generator set has *not* been activated.

Let Fermont analyze your power needs, recommend and update your present power system to one designed specifically for your present and future requirements. The result will be No-Fail Power, sized and incorporated in your present system, supplying precise power for critical loads that require continuous uninterrupted power for reliable operation.



**Fermont**  
141 North Avenue,  
Bridgeport, Connecticut 06606



# Fermont

141 NORTH AVE. · BRIDGEPORT, CONN. 06606 · TEL: 203/366-5211

March 1, 1966

Mr. T. Nelson, Sys. Const.  
Box 1546  
Poughkeepsie, New York 12603

RE: No-Fail Power for Critical Equipment

Gentlemen:

Thank you for your interest in our No-Fail Power System. Enclosed is a brochure detailing the operation and performance characteristics of this system.

The No-Fail Power System is a power system designed to assure a continuous flow of precise power to critical loads. Unlike emergency stand-by engine-generator sets which require up to 20 seconds to supply emergency power, the NFP system maintains the power flow without break. This is accomplished through the utilization of three energy sources - commercial power, hydraulic power and diesel power. It uses commercial power when commercial power is sound, hydraulic power when commercial power fails and diesel power when commercial power fails for an extended period of time.

The system is designed to power critical loads such as computers, communication systems and processing equipment, or other voltage and frequency sensitive equipment, where failures are costly or could lead to tragic results. Loads powered through the No-Fail Power System sense NO variation in power characteristics even though commercial power may fail in a catastrophic manner as it did last year in the Northeast.

A unique feature of our system is the ability of the stored energy unit to maintain power frequency output within  $\pm \frac{1}{4}$  cycles of 60 cps for a period of time without starting the auxiliary diesel engine or an associated engine-generator set. This permits our system to eliminate power fluctuations, transients, or power outages or surges of short duration, which are detrimental to critical equipment operation, without starting the auxiliary diesel engine. When commercial power problems of this nature occur, the system automatically

switches to hydraulic drive for a short period of time and switches back to commercial drive when the fluctuations have ended. The auxiliary diesel is started only if the fluctuations continue or a complete commercial power outage occurs for an extended period of time. The No-Fail Power System is the only rotative system that can do this and hold such close frequency and voltage tolerances - the type of regulation now required for errorless operation of today's sophisticated electronic equipment.

We would be pleased to discuss our system further with you. Whether your interest is in the area of an NFP system, which includes an engine, or an NFPS system, which does not include an engine and can be used in conjunction with an existing engine-generator set, the No-Fail Power System will eliminate your power problems.

Please contact this office detailing your requirement for us. We will then prepare a proposal showing you how this system can assure you of transient free power for your critical equipment.

Very truly yours,  
Fermont Division -  
Dynamics Corporation of America



T. G. Fretel  
Sales Department

TGF:mar  
Enc.